

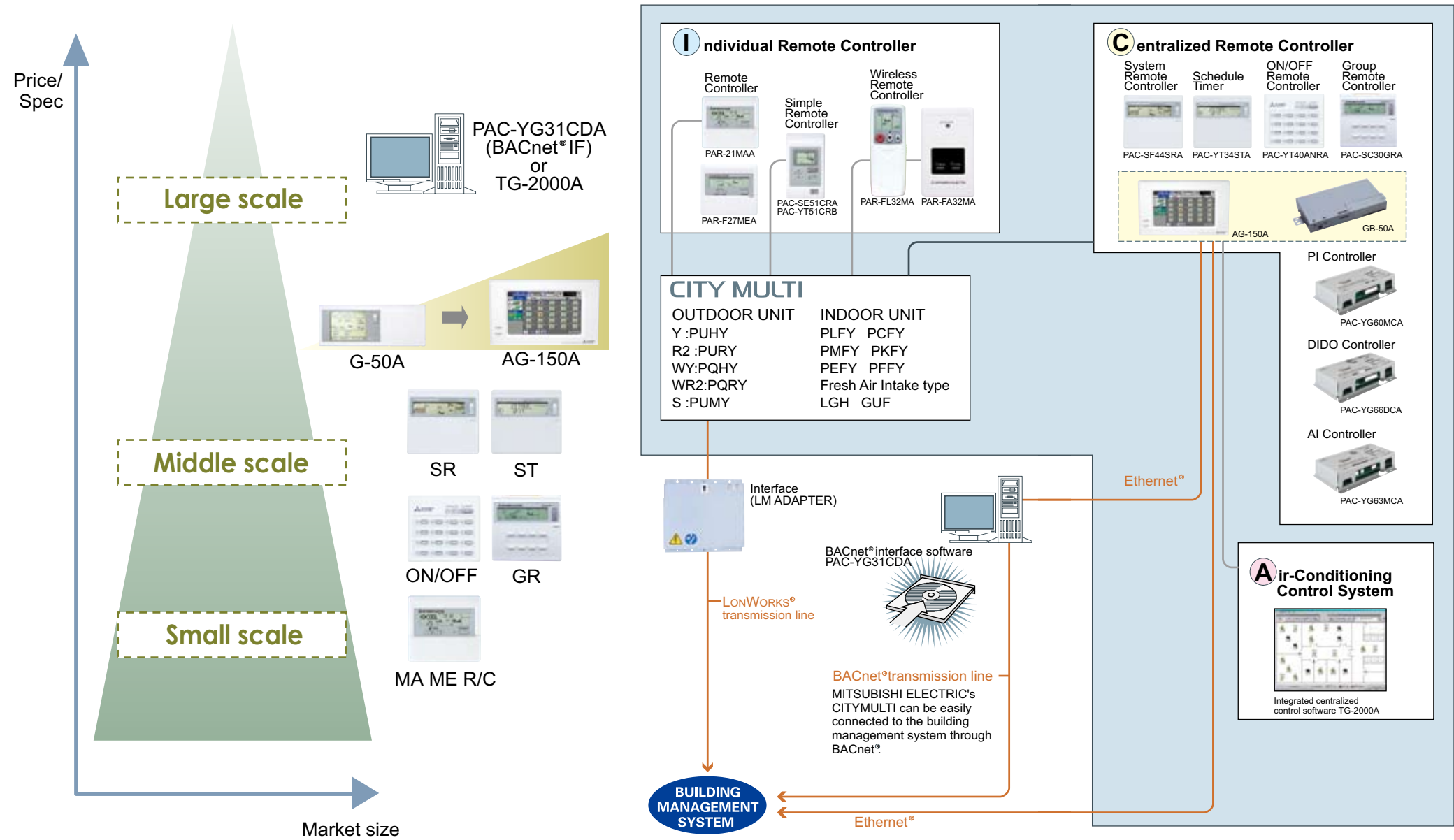
AG - 150A CITY MULTI

Sales / Technical Guide

This document covers the functions for AG-150A software Ver. 1.20
Functions planned to be added in the later versions are not described.



AG-150A - Visualizing control -



Controllers are one of the most important and familiar devices in an air conditioning system. Not only does it control to provide optimum air environment but supports operations to minimize running costs and to preserve energy. Through studies and development, we've visualized a new system controller meeting needs with versatile options. –Design your control with our new centralized controller; AG-150A.

Comparison between New AG-150A and Conventional G-50A

		Unit		WEB	
		AG-150A	G-50A	AG-150A	G-50A
Operation	ON / OFF	✓	✓	✓	✓
	Operation mode	✓	✓	✓	✓
	Temperature setting	✓	✓	✓	✓
	Fan speed	✓	✓	✓	✓
	Air flow direction	✓	✓	✓	✓
	Permit / Prohibit local operation	✓	✓	✓	✓
Monitoring	ON / OFF	✓	✓	✓	✓
	Operation mode	✓	✓	✓	✓
	Temperature setting	✓	✓	✓	✓
	Return air temp. (ambient temp)	✓	SET	✓	✓
	Error	✓	✓	✓	✓
	Fan speed	✓	✓	✓	✓
	Air flow direction	✓	✓	✓	✓
	Filter sign	✓	✓	✓	✓
Floor layout (from USB port)		SET	—	SET	—
Scheduling	Weekly Schedule	✓	✓*1	✓	OP✓
	Optimized start-up control	✓	NA	✓	NA
	Seasonal schedule	OP✓	NA	OP✓	NA
	Annual Schedule	OP✓	NA	OP✓	OP✓
	Max.50 days schedule setting for 24 months	OP✓	NA	OP✓	OP✓
	Today's Schedule	OP✓	NA	OP✓	OP✓
	Day schedule can be changed without changing weekly or annual schedule	OP✓	NA	OP✓	OP✓
	Time setting unit	1 min	10 min	1 min	1 min
	No. of settings per day	24	6	24	12
	Item: ON / OFF, Operation mode, Temp. setting, Permit / Prohibit local RC, fan speed, air-flow direction	✓	✓ (only ON/OFF, RC prohibit)	✓	✓ (exclude fan speed, air flow direction)
Night setback		✓	NA	✓	NA
External output	ON / OFF, Error / Normal	✓	✓	—	—
External input	ON / OFF, Emergency stop	✓	✓	—	—

✓ : Available
NA : Not available
OP✓ : Available with option. License registration required.
SET : Available by changing the setting
*1 ON/OFF 3times/pattern. 3pattern+prohibit pattern/week.

We offer a wide range of air conditioner management to meet all requirements from the smallest and simplest to the largest and most complex. Among those controllers, AG-150A centralized controller covers the application ranges from middle to large sized buildings.

With a new coloured touch panel, new functions, and continuation of all the current G-50A functions, AG-150A visualizes its functions from basic control to advanced operations and bringing an ultimate controller to reality.

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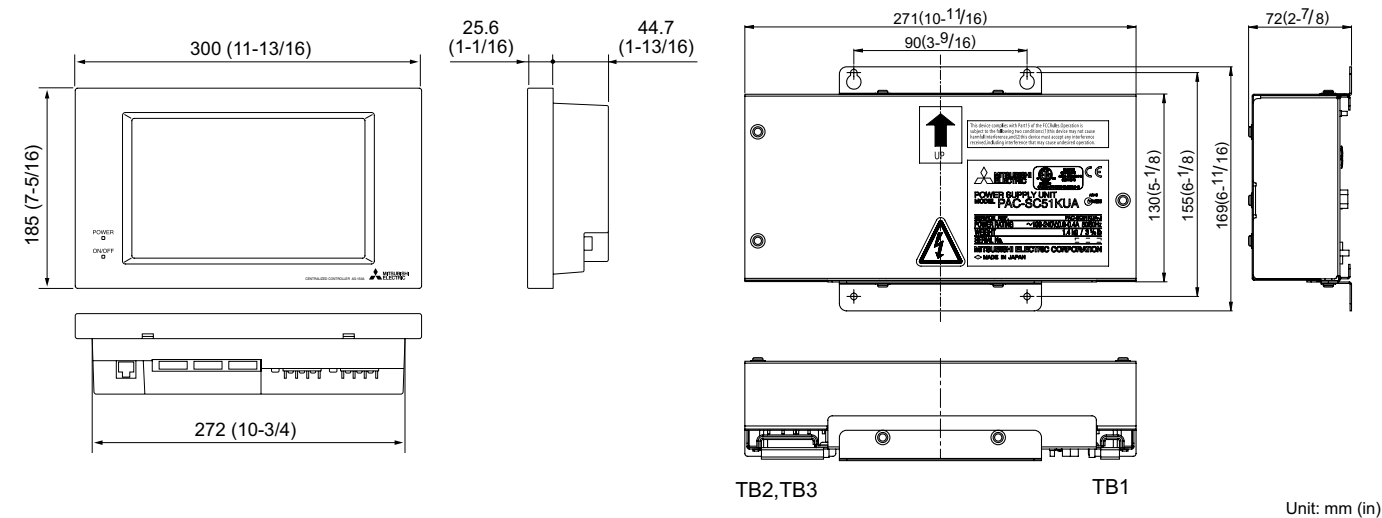
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New design

Dimension

AG-150A



Backlight color liquid crystal display



- Easy to see and control.
- Able to identify whether a unit is ON or OFF from a distance.
- Switches ON when touched or in operation
First touch turns ON the backlight, followed by operation touch.
- Turns OFF when there is no operation for 10mins
- Turns ON during unit malfunction (Alarm, Error) when the backlight is OFF.

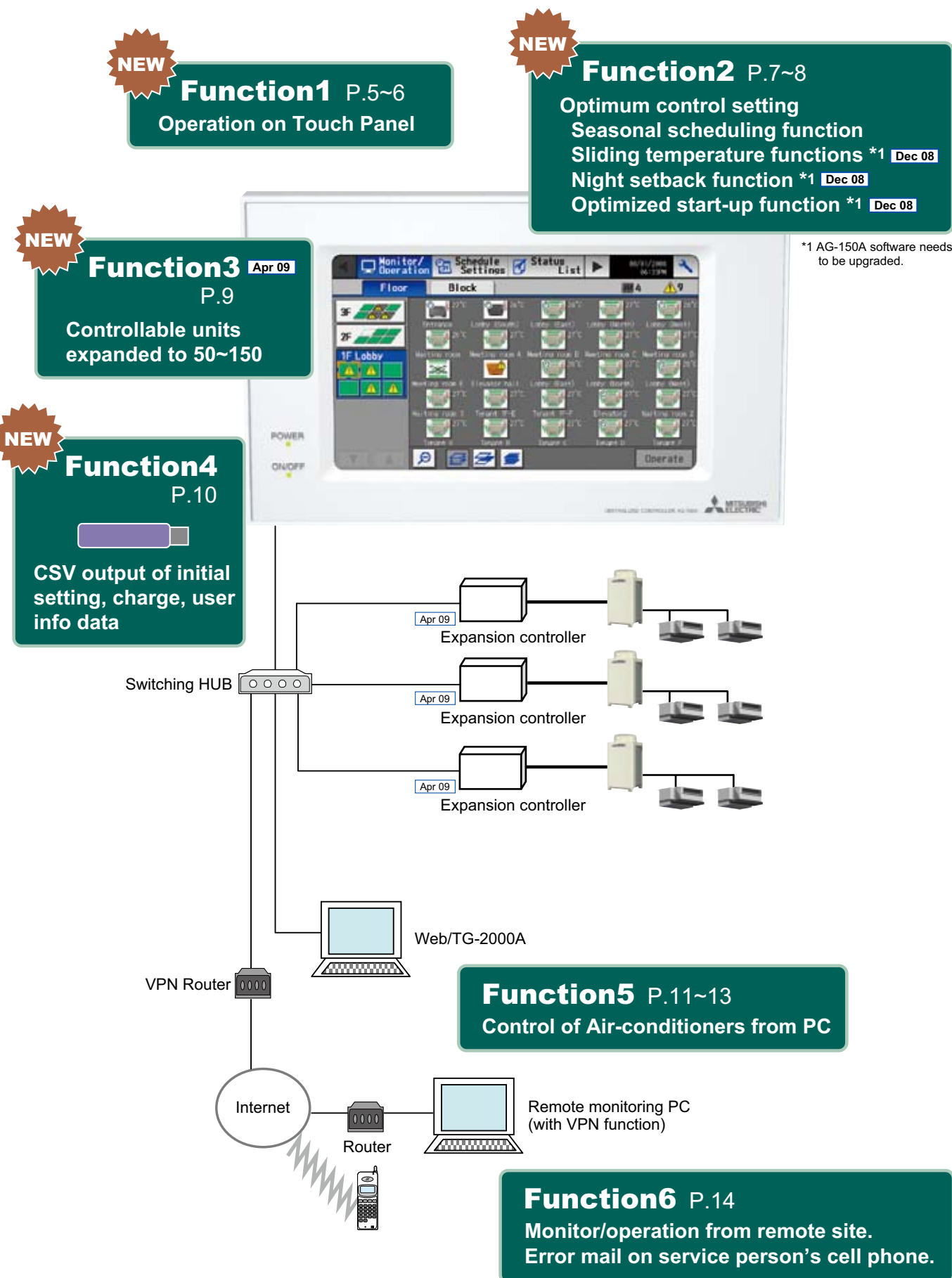
Back Structure



- Easy installation
 - Ways to install-wall embedded/wall mounting
- *For further information, refer to page 17

Functions

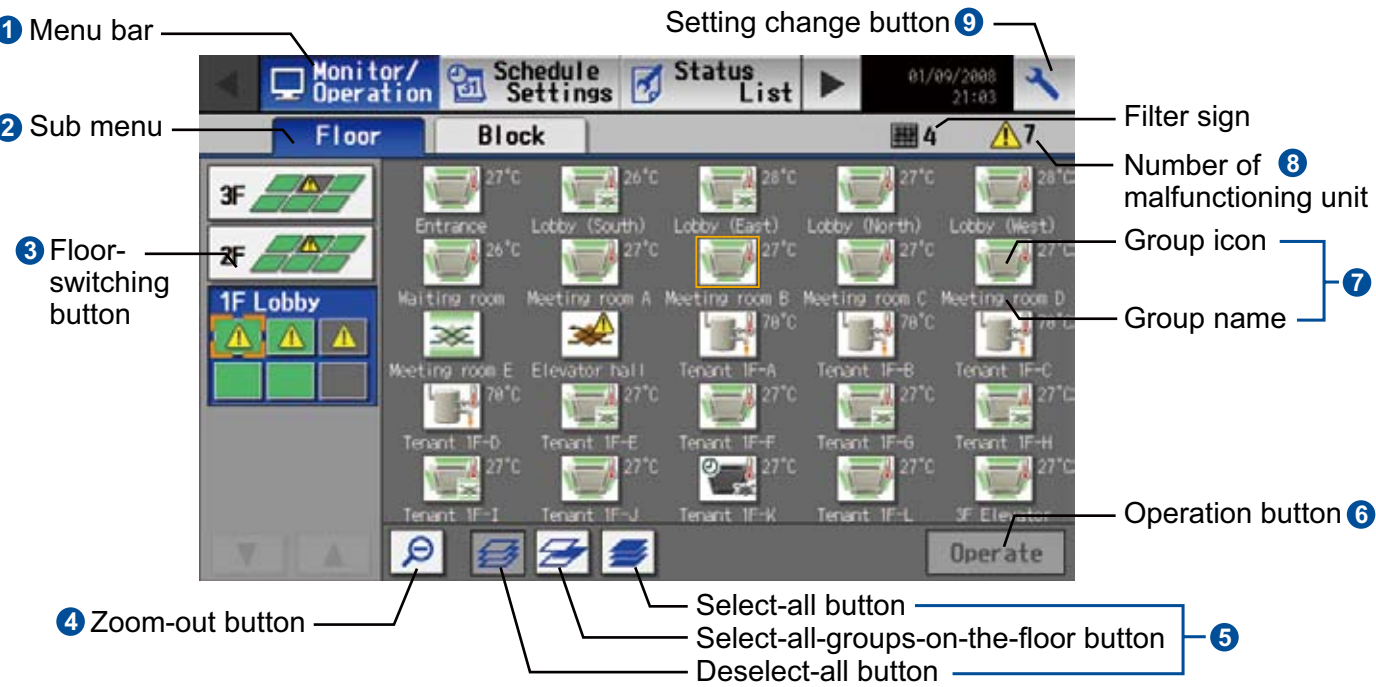
The need for control is paramount in order to optimize the performance of any air conditioning system. AG-150A offers a wide range of control functions designed to do just this. For further information on each function, refer to the pages indicated.



Function1

● Operation on Touch Panel

The new colour touch panel is the ultimate function AG-150A offers which enables easy to monitor and operate with just touching the panel with your fingers.
Here are the functions available on the colour touch panel.



Operation by touching with index finger

In order to change operation status, just touch the icon with index finger and an orange box appears around the unit icon indicating the selected unit.

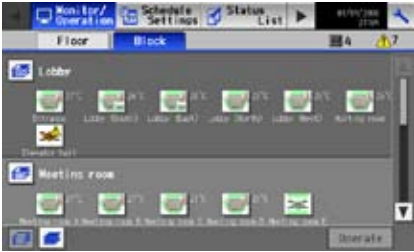
Multi-language, total of 8

Language can be selected from the following.
Japanese/English/French/German/Spanish/Italian/Russian/Chinese (*English/Spanish only in Ver. 1.01~1.03)

- 1 Menu bar
“Monitor/Operation”, “Schedule Settings”, “Status List”, “Log” can be selected.
- 2 Sub menu
Change display between by floors or by block.



Floor layout screen



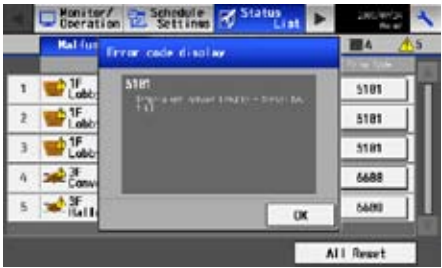
Block display screen

- 3 Floor-switching button
Select the floor to monitor or operate. Floors to be displayed can be selected.
- 4 Zoom-out button
Display size can be reduced. Floors to be displayed can be selected.
- 5 Select-all button/Select-all-groups-on-the-floor button/Deselect-all button
Touching each unit with your index finger can select units or if the setting applies to multiple units, it is also possible to select all units by floor or system and cancel the selection.
- 6 Operation button
After selecting a unit, when you click a unit or this operation button, the display will appear to specify setting.



Operation screen

- 7 Group icon/Group name
Each unit and its status are displayed and visible on the touch panel giving the information wanted in a glance.
- 8 Number of malfunctioning unit
To check what kind of error has occurred in the system, click on the yellow exclamation mark at the upper right corner and the malfunction list appears. To check details, click on [error code] number and a screen explaining the error will appear.



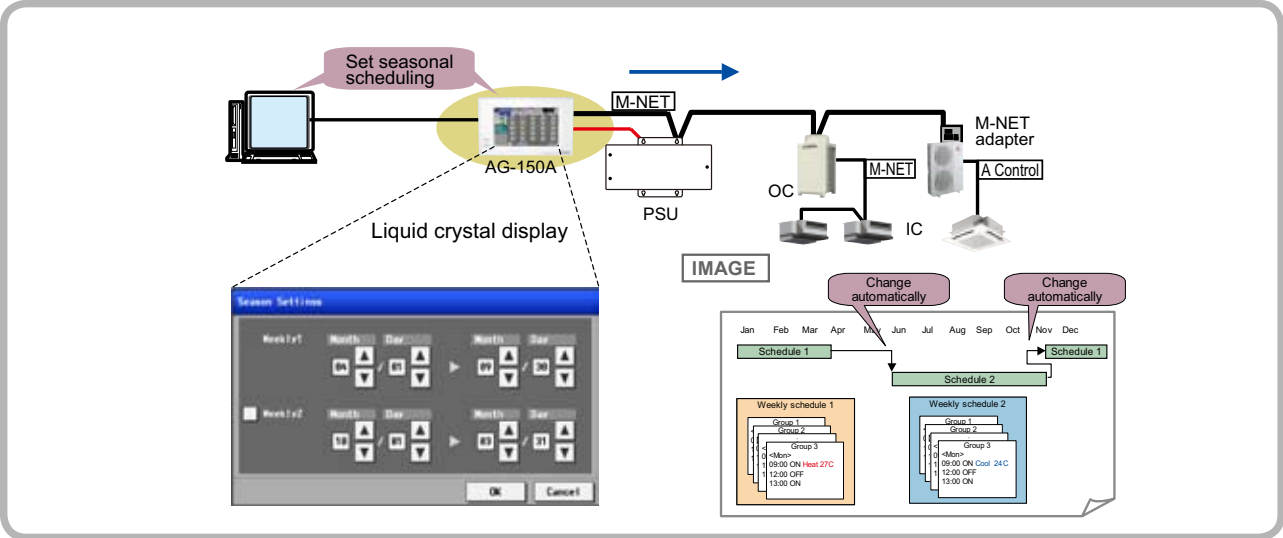
- 9 Setting change button
Initial setting can be changed.

Function2

● Optimum control setting

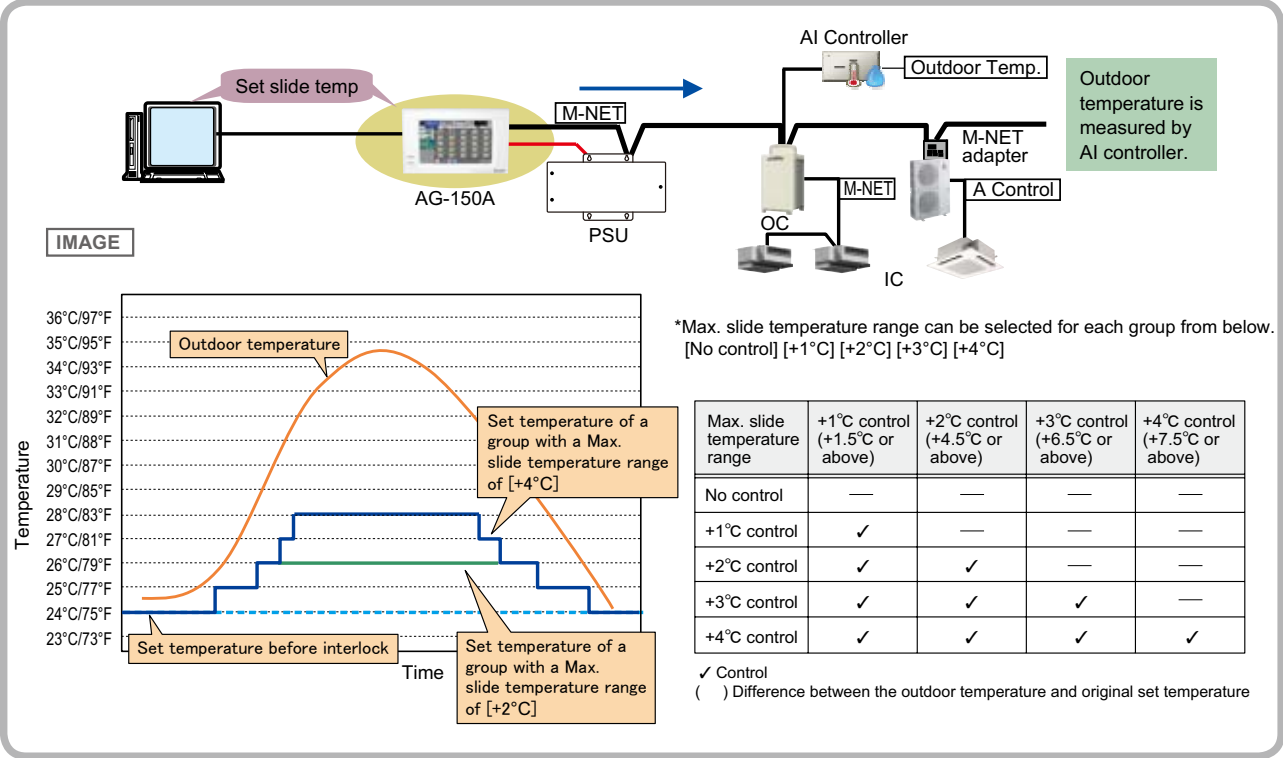
Seasonal scheduling function

With a seasonal scheduling, it is possible to set weekly schedule by seasons. 2 patterns of weekly schedule (Weekly1, Weekly2) and day/month to apply that schedule can be set which automatically shifts when it reaches the scheduled day of the year.



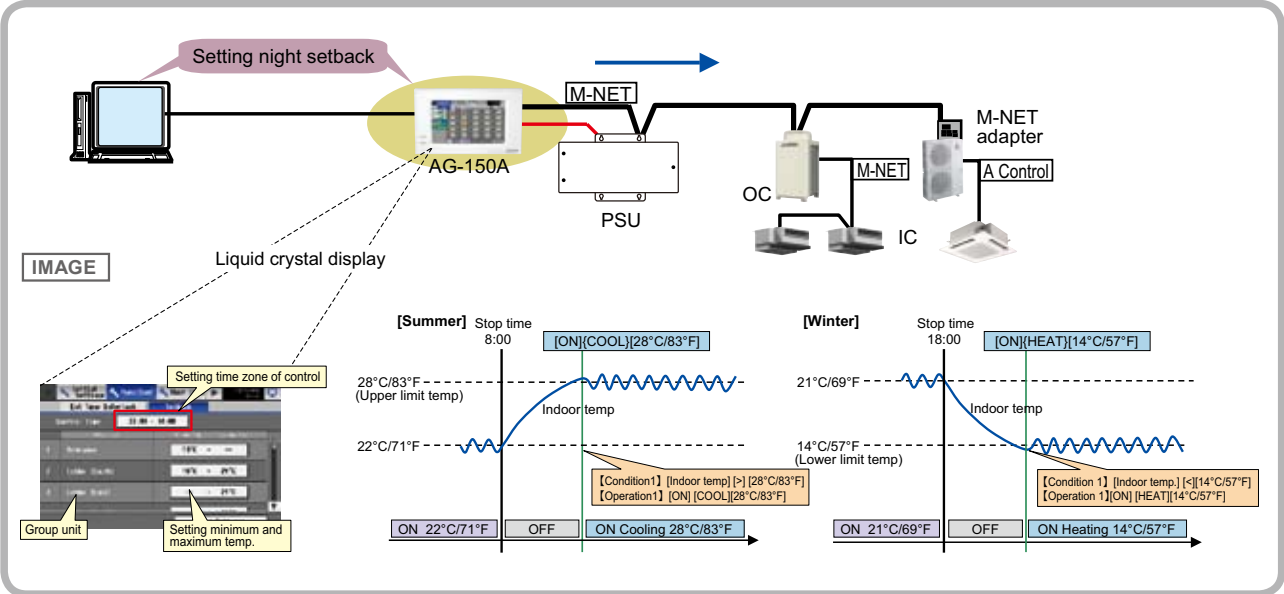
Sliding Temperature control

In this interlock function, the outdoor temperature is used to slide the set temperature of a room. This prevents a person from getting a shock (sick) of sudden change in temperature when they enter a building from being outside. Also this process is very effective for energy saving. This function enables to set different max. slide temperature range per group in accordance to the change in outdoor temperature.



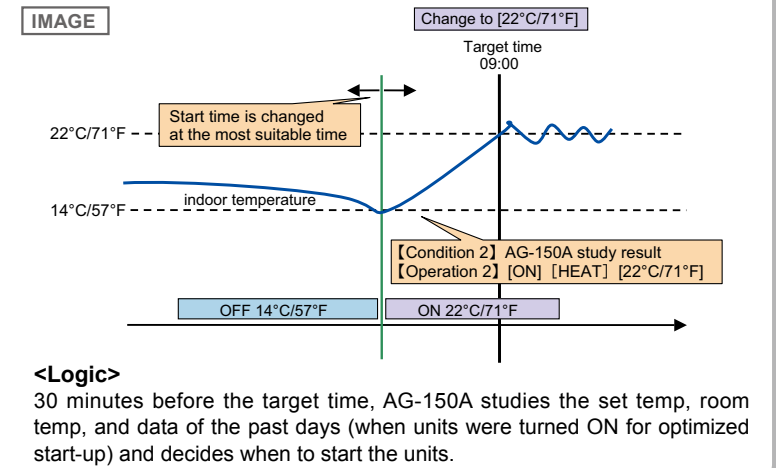
Night setback Function

In night setback function, indoor temperature is maintained to a set temperature. This prevents frost formation in the winter. When the temperature goes below a specific value, the unit starts in HEAT mode at low temp. Since the units only start at HEAT mode when it goes below a specific temperature, it is very effective for energy saving. (Conventional methods: units only start at a decided time set by schedule)



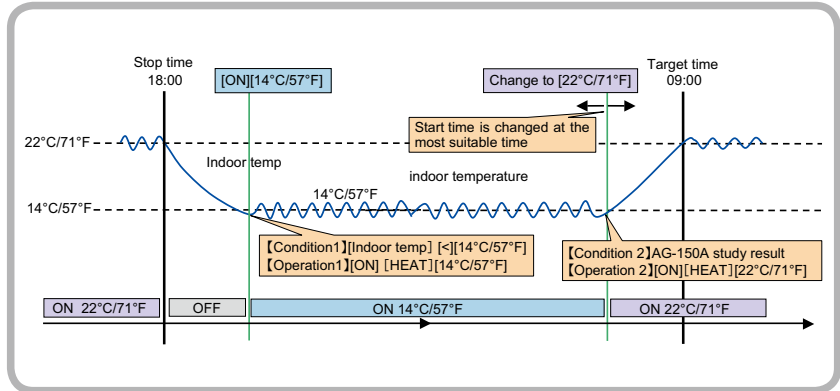
Optimized Start-up control

With this start up function, pre operation will be performed to bring the temperature to the specified temperature at the specified time providing optimum air environment all year around. For example, when it is set as 22°C/71°F heating at 9:00, operation will start at 8:45-15min before 9:00, and will achieve 22°C/71°F at 9:00. AG-150A will decide when pre-cooling should start 30 minutes before the target time based on set/room temp and data of the past days (when units were turned ON for optimized start-up control).



Setback + Optimized start-up control

When combining the two functions together, a highly effective temperature control is possible. For example, setback is set at 14 °C/57°F, unit will start its heating operation when the indoor temperature goes below 14°C/57°F. Simultaneously, if the optimized start-up control targets 22°C/71°F at 9:00, AG-150A will decide when pre-heating should start and obtain the desired temperature at the required time.



Function3

● Controllable units expanded TENTATIVE

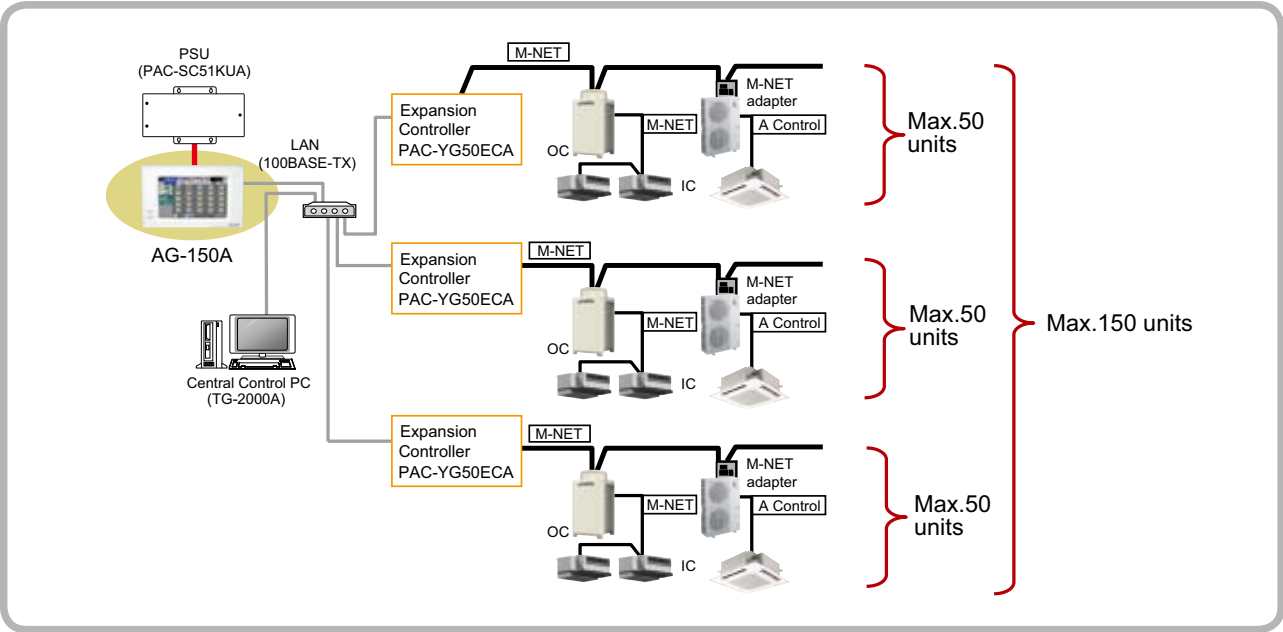
Maximum of 50 units

Include indoor units, LOSSNAY, DIDO (contacts), PI and AI controller.
*DIDO has 6 contact points. 1 contact point is counted as 1 indoor unit.
*Only 5 PI controllers can be connected to 1 AG-150A.
*Depending on the model, indoor units may be counted as 2 or more units.

Maximum of 150 units

April 2009

AG-150A software needs to be upgraded and Expansion controller (PAC-YG50ECA) is required.
Power supply for M-NET is included in the Expansion controller.



Controller	Connectable maximum no. of units
TG2000	2000 units
G-50A	50 units
AG-150A	150* units

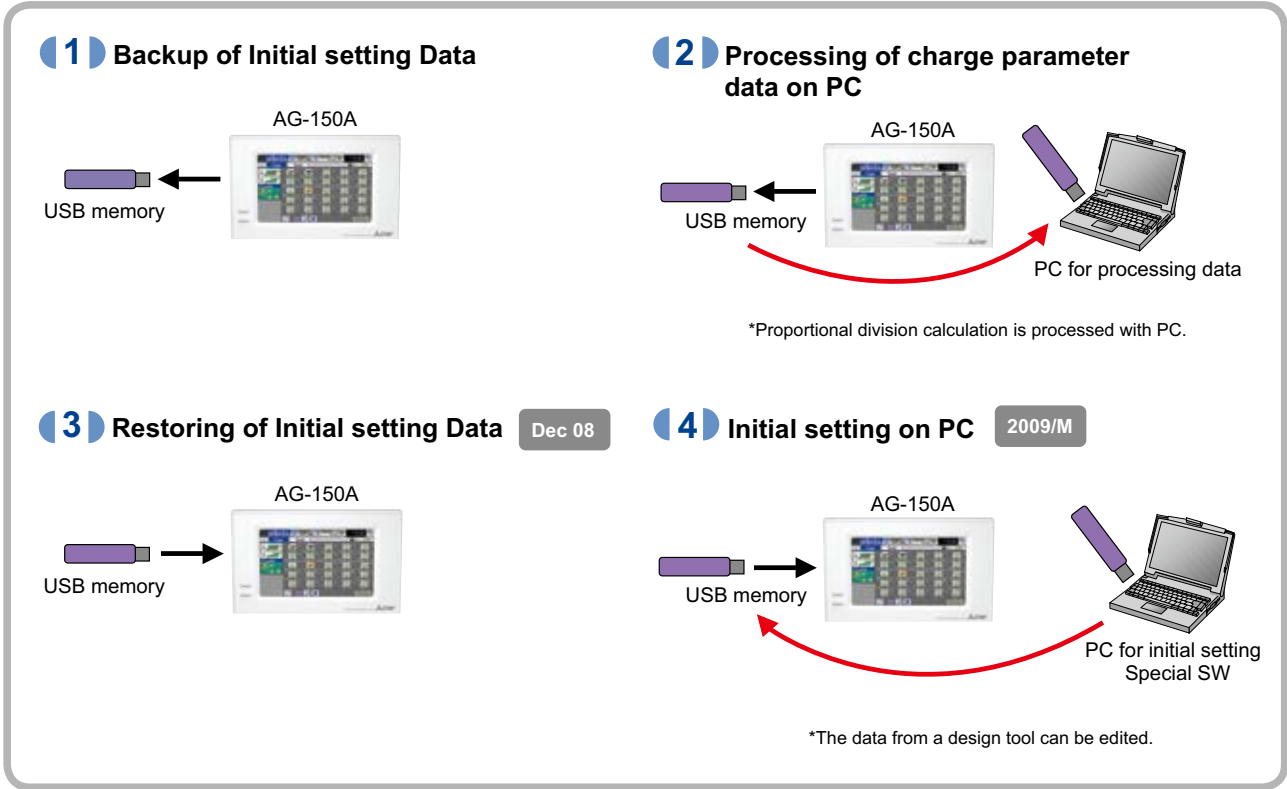
*Up to 50 units per Expansion controller, up to 3 expansion controllers

Function4

● USB Memory

AG-150A has a USB memory slot. Data can be extracted or restored incase there is a fault or resetting a system.

Note : Please use the following USB memory.
Manufacturer : Sandisk, model : SDCZ6-2048-J65RB, 2G Byte
Manufacturer : Kingston, model : DT400/2GBFE, 2G Byte
* We are planning to add brands and models of USB memory in the future.



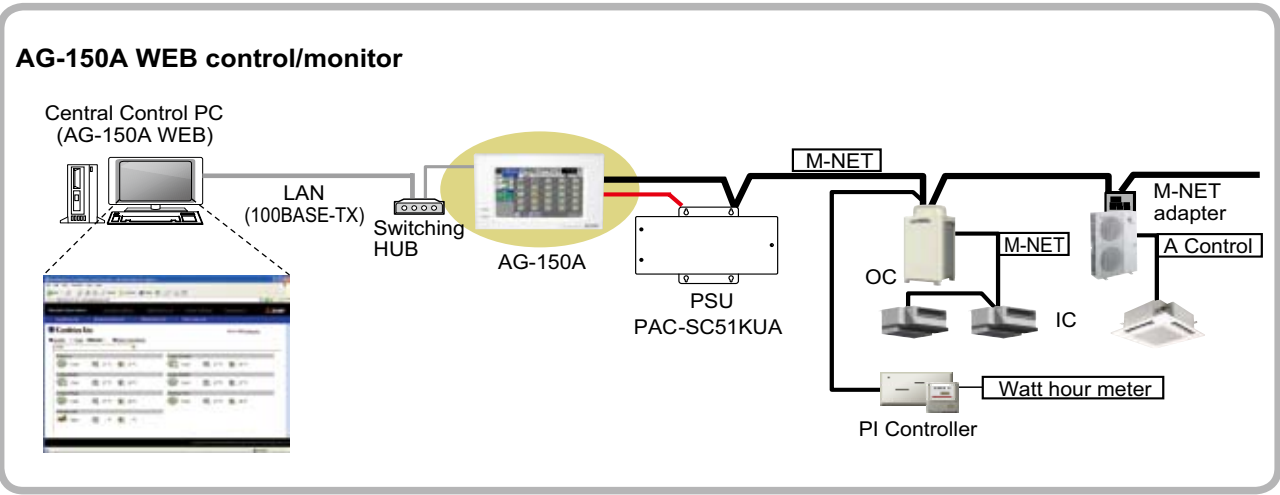
Function5

● Control of Air conditioner from PC

There are two ways to monitor air conditioner through a personal computer (PC).
One is from AG-150A WEB (Monitoring PC) and another with a TG-2000A (Central control PC).
*In both cases, control/monitor in a private network.

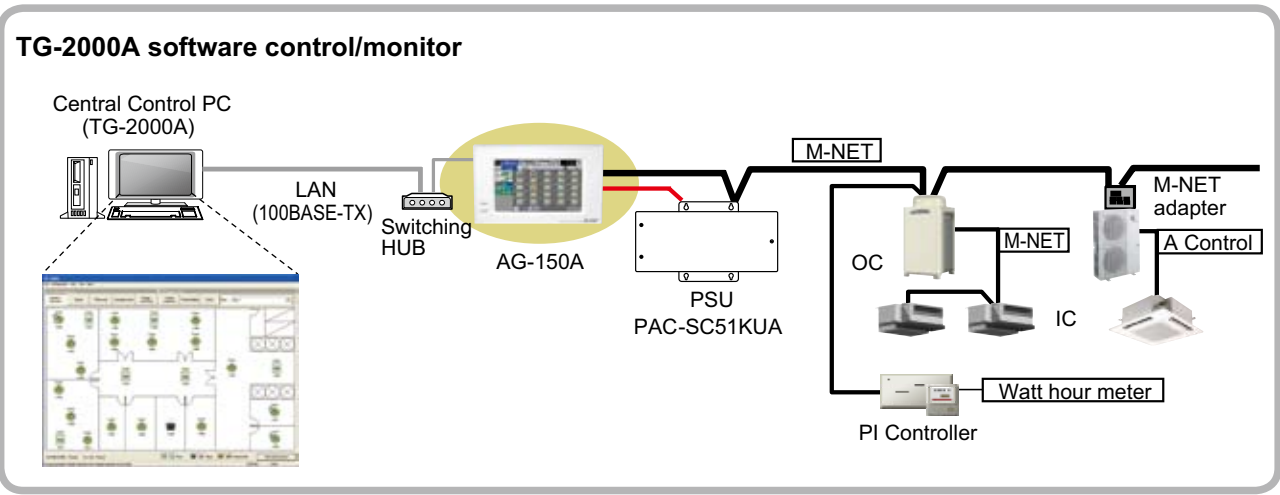
1) AG-150A WEB

Without special software, air conditioners can be controlled over a PC by just connecting a LAN and registering WEB license. Units can be controlled collectively or in groups, and by blocks or floors. Also, setting of annual schedule is possible with a license.
Number of AG-150A controlled/monitored per screen: 1 AG-150A (max. of 50 indoor units)



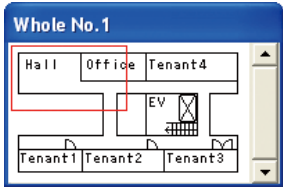
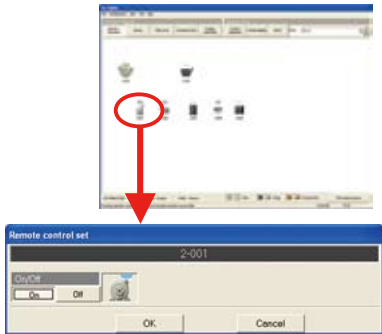
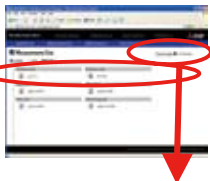
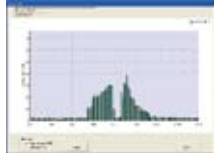
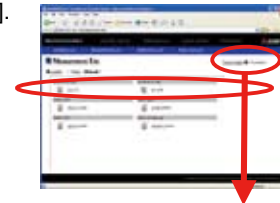
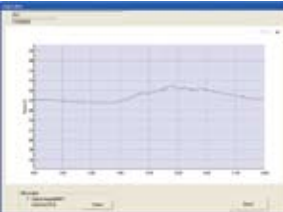
2) TG-2000A

With TG-2000A software, up to 2000 indoor units can be controlled/monitored.
Compared to the AG-150A WEB, air conditioner layout by room and floor can be displayed and all AG-150A in one system will be shown enabling easy control/monitoring.
*For AG-150A, a new version TG-2000A (Ver 5.50 or later) is required and a current version cannot be used.



● Comparison between AG-150A WEB and TG-2000A control/monitoring

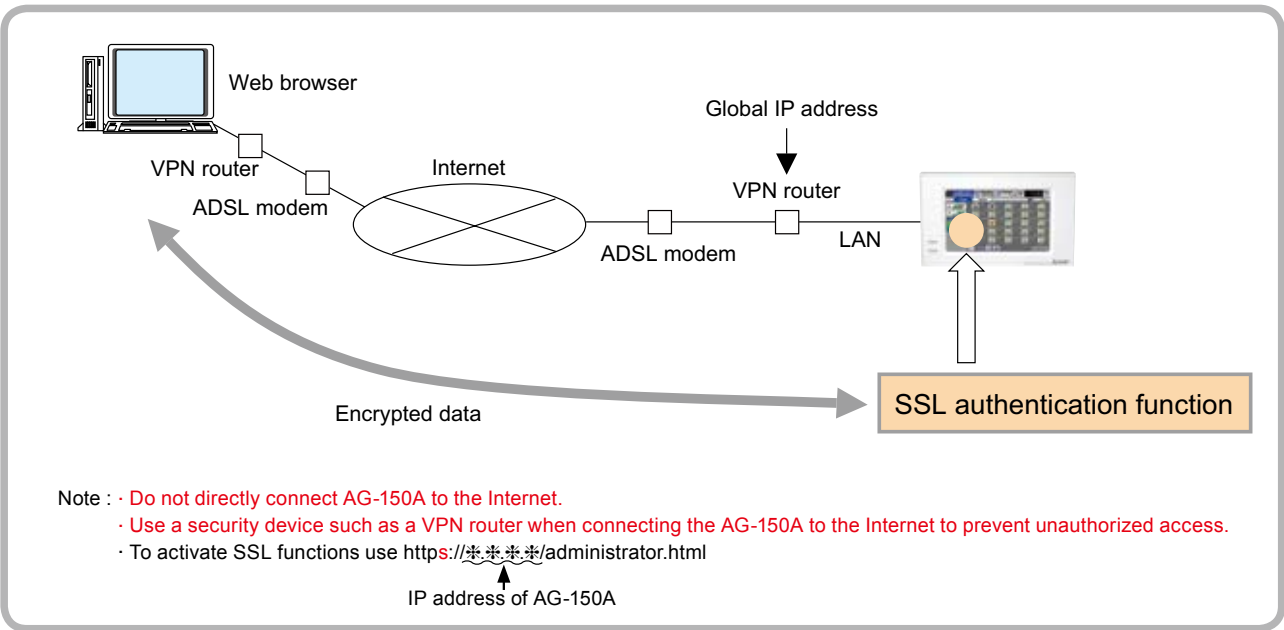
	AG-150A WEB (Monitoring PC) control/ monitor	TG-2000A software (Central control PC) control/monitor
General description	Maximum of 1 AG-150A (50 units)*1 can be controlled/monitored. Total of 254 AG-150A and monitoring PC can be connected to one LAN system. Screen-display is per AG-150A. *1.Units include indoor units, LOSSNAY, DIDO, PI and AI controller. DIDO has 6 contact points. (1 contact point is counted as 1 unit.) Large capacity indoor units are counted as 2 or 3 indoor units.	Maximum of 40 AG-150A (2000 units)*1 can be screen-displayed to control/monitor. For apportioned electricity calculation, TG-2000A Software is required.
Daily/ Weekly1/ Weekly2/Annual schedule	✓ License registration required (Weekly1 schedule license unnecessary) Units that can be scheduled: Indoor units, general equipment (Schedules can be copied)	✓ License registration required
Apportioned Electricity Calculation (charge data)	NA	✓ License registration required (Energy management license) PI controller required.
Accumulated operation time	NA	✓ License registration required (Energy management license)
Energy saving/Peak cut control	✓ License registration required (Energy management license) For peak cut control, PI controller is required for electricity monitoring method.	✓ License registration required (Energy management license)
General equipment control	✓ (DIDO controller required)	✓ (DIDO controller required)
Indoor unit/general equipment operation display	Screen-display is per AG-150A. Maximum of 50 units can be displayed. 	Operation of maximum 2000 units can be displayed.
Block display		
Floor plan display	Available from Dec. 2008 	

	AG-150A WEB (Monitoring PC) control/ monitor	TG-2000A software (Central control PC) control/monitor
All floor plan display	Floor and section display only. NA	In case floor is divided into four sections. 
Controller Display (DIDO controller)	Click general equipment icon for operation screen. 	Click general equipment icon for operation screen. 
Measurement monitoring (PI controller)	Present value of measurement can be displayed from [Measurement list].  Trend graph (electricity only) can be displayed from [Tool] - [Graph display]. 	Present value of measurement can be displayed from [Maintenance of charge data] - [Present volume monitor].  Trend graph can be displayed from [Tool] - [Graph display]. 
Measurement Monitoring (AI controller)	Present temp. and humidity can be seen from [Measurement list].  Measurement can be displayed from [Trend graph]. 	Present temp. and humidity is indicated above the AI controller icon on the floor plan.  Trend graph can be displayed from [Tool] - [Graph display]. 

Function6

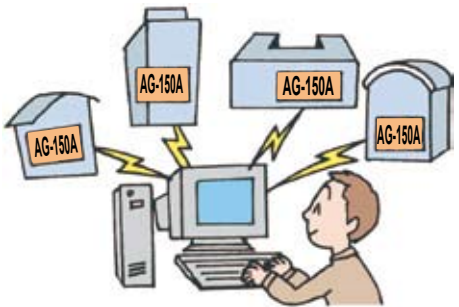
Internet connection

- Enables control and monitor multiple properties from a remote location
- Notification by e-mail to mobile phone or PC



Remote monitoring

Monitoring and controlling on PC at desk or even in remote buildings
No need to check every controller when turning ON/OFF



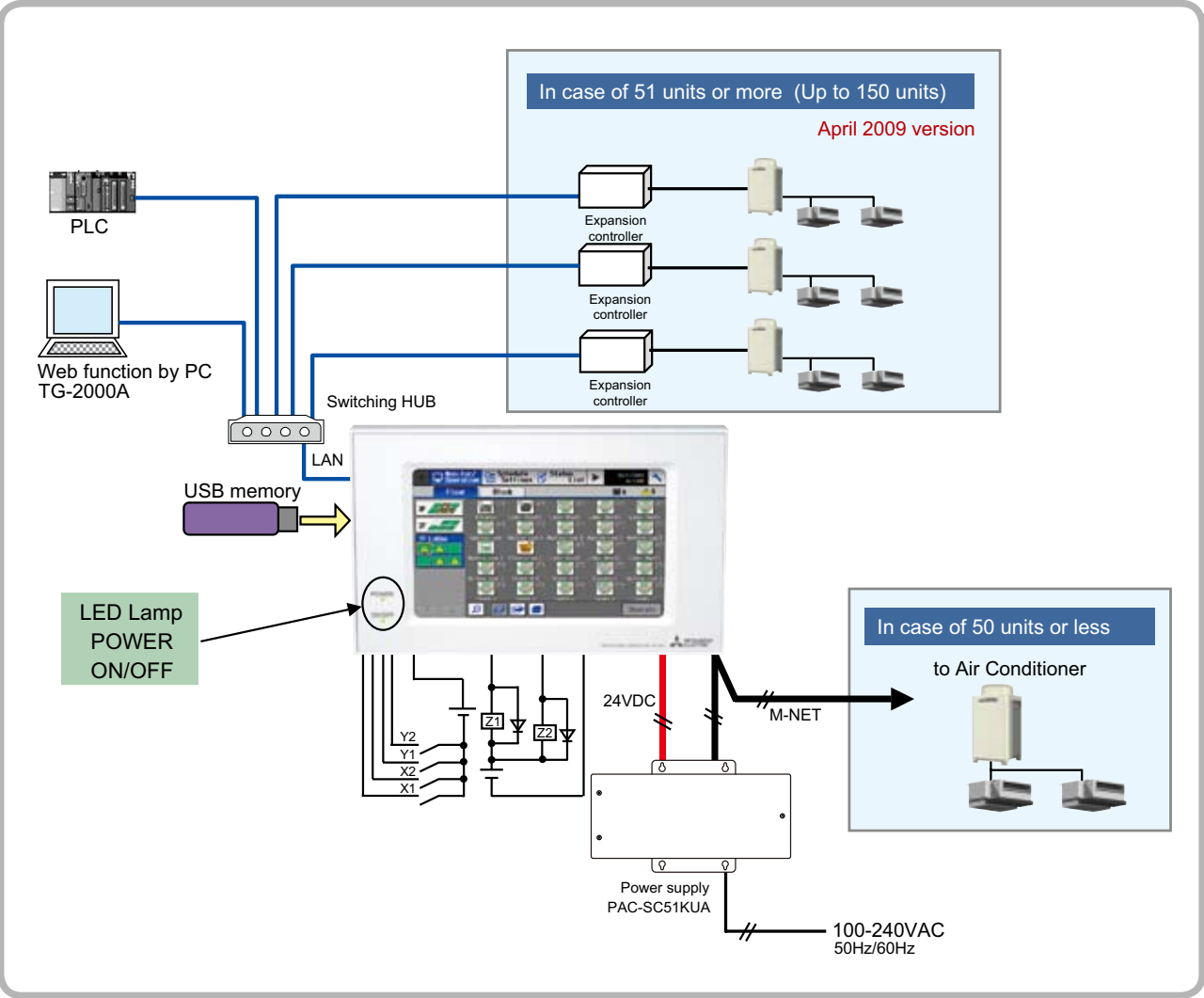
Error e-mail

Reports are provided to the designated e-mail addresses in the events of troubles.
Quick restoration is possible by understanding the causes of trouble in advance.



System structure

● System structure



■ External input: select A, B or C (on Network setting screen or on Initial setting web)

A	Level input	Emergency STOP
B		ON/OFF
C	Pulse input	ON/OFF/Prohibit local operate/Permit local operate

■ External output

One or more IC: ON	ON signal output
One or more IC: Malfunction	Malfunction signal output

1. Management of 50 or less units same as current system

AG-150A can control up to maximum of 50 units

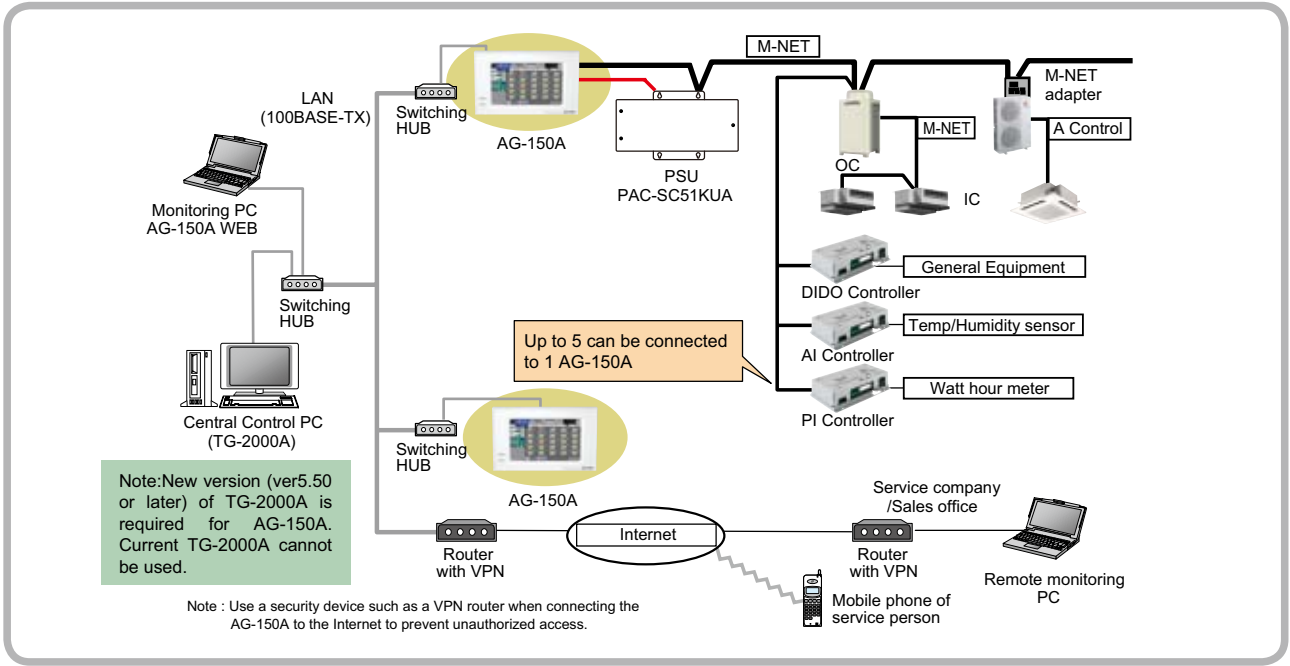
Units: include indoor units, LOSSNAY, DIDO (contacts), PI and AI controller.

*DIDO has 6 contact points. 1 contact point is counted as 1 indoor unit.

*Only 5 PI controllers can be connected to 1 AG-150A.

*Depending on the model, indoor units may be counted as 2 or more units.

When 50 or less units have to be controlled, AG-150A is connected directly to M-NET (as conventional G-50A).



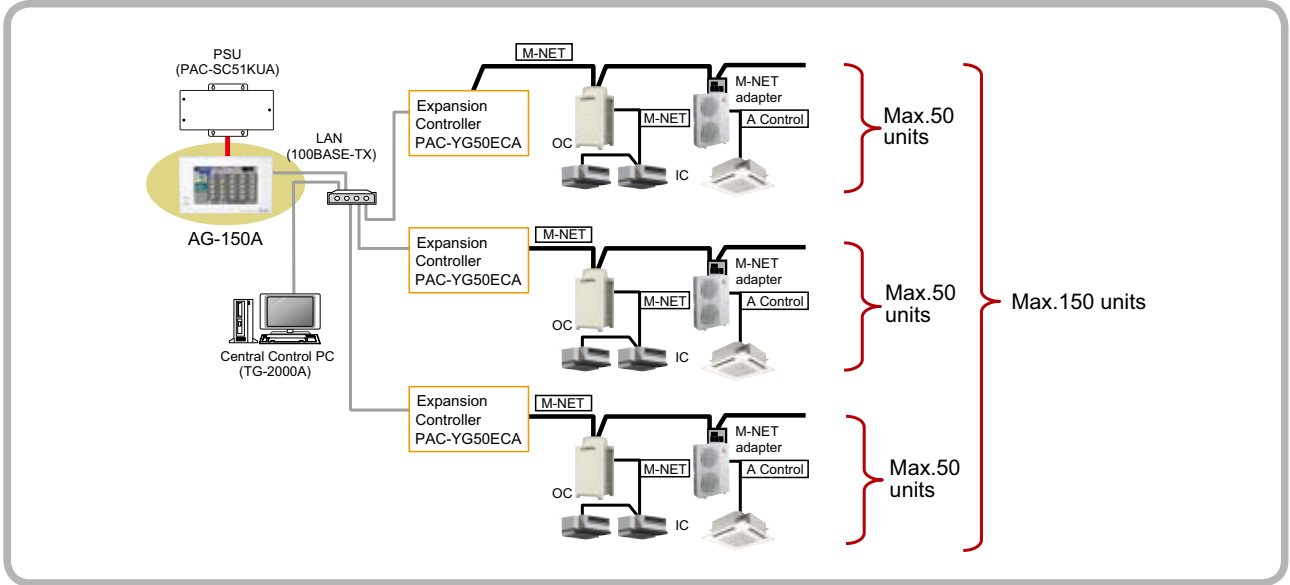
2. Management of 51 or more units Apr.2009

When managing 51 or more units, EXPANSION CONTROLLER (EC) is required.

*Connection between AG-150A and EC is done using LAN cable (Ethernet)

*50 units can be connected to 1 EC.

*3EC can be connected to 1 AG-150A through Switching HUB.

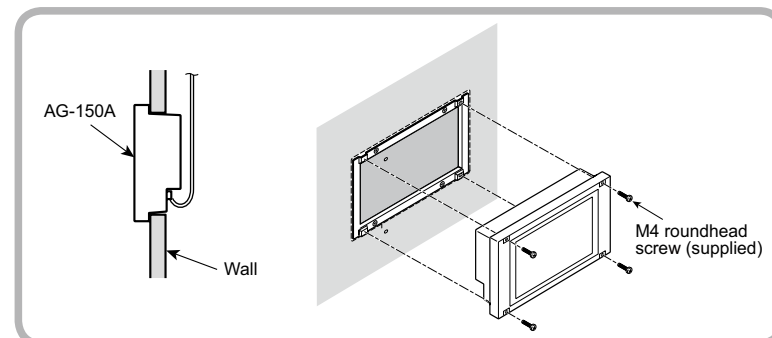


Installation

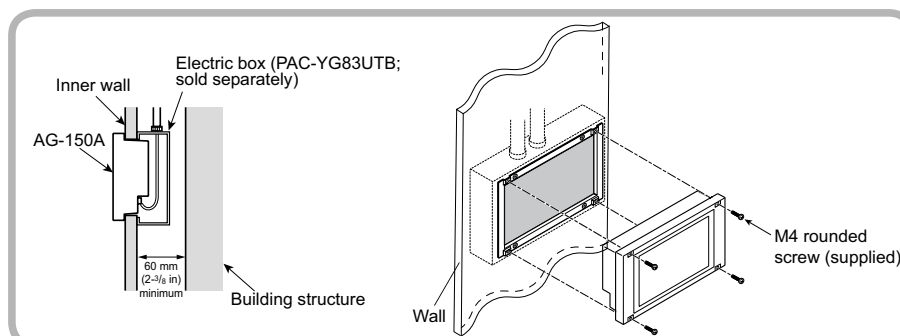
● Installation Method

1) Embedding AG-150A in the wall

To embed AG-150A in the wall, A and B type installation plate (supplied with AG-150A) is required.



2) Wall-Embedded installation with an electric box



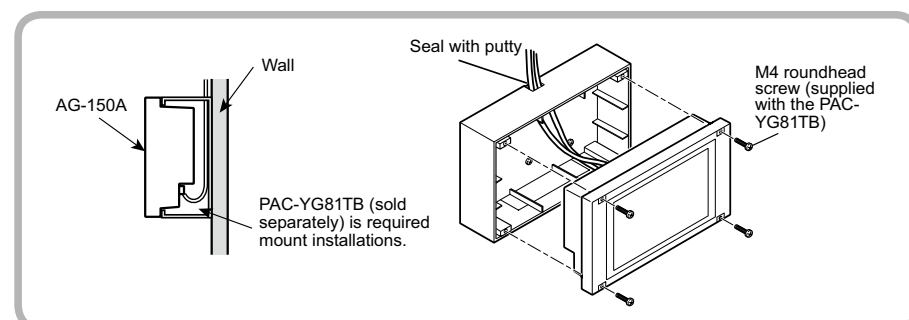
Embedding AG-150A on the wall and mounting it to electric box (PAC-YG83UTB). Electric box is separately sold optional part.

Option:
Electric box
(PAC-YG83UTB)

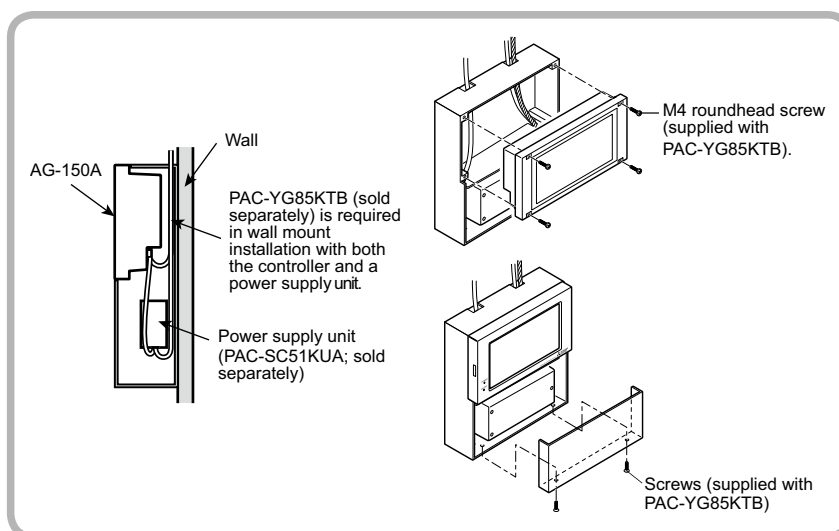
3) Wall-mounting AG-150A

To install AG-150A on the wall, Mounting attachment B type (PAC-YG81TB) is required.

Option:
Mounting attachment
B type (PAC-YG81TB)



4) Installing AG-150A and PSU inside the mounting attachment on the wall



Mounting attachment A type (PAC-YG85KTB) is required when installing AG-150A and PSU on the wall.

Option:
Mounting attachment A type
(PAC-YG85KTB)

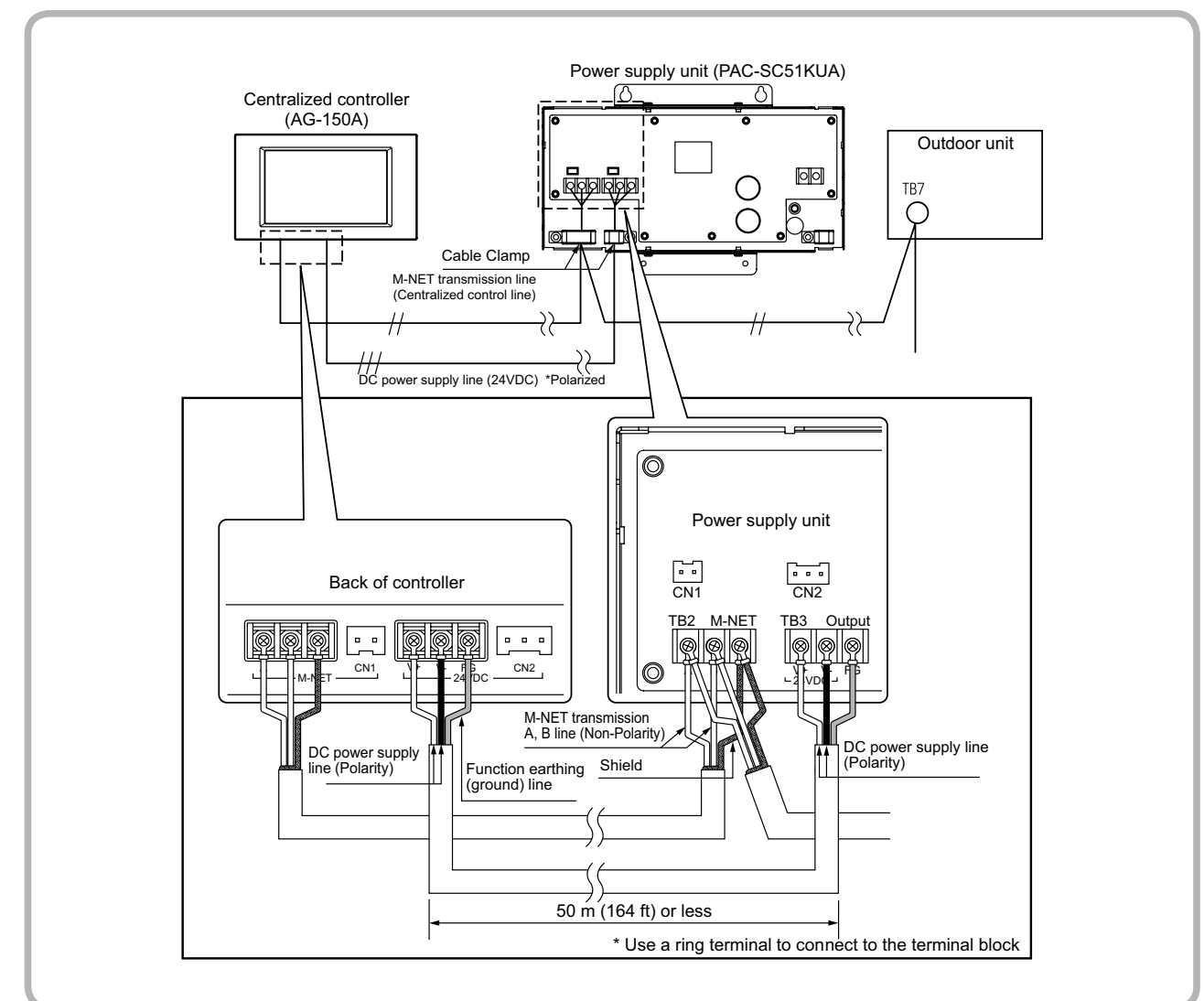
Wiring

● DC Power Supply and M-NET Transmission Line

There are two ways to connect AG-150A and Power Supply Unit PAC-SC51KUA.

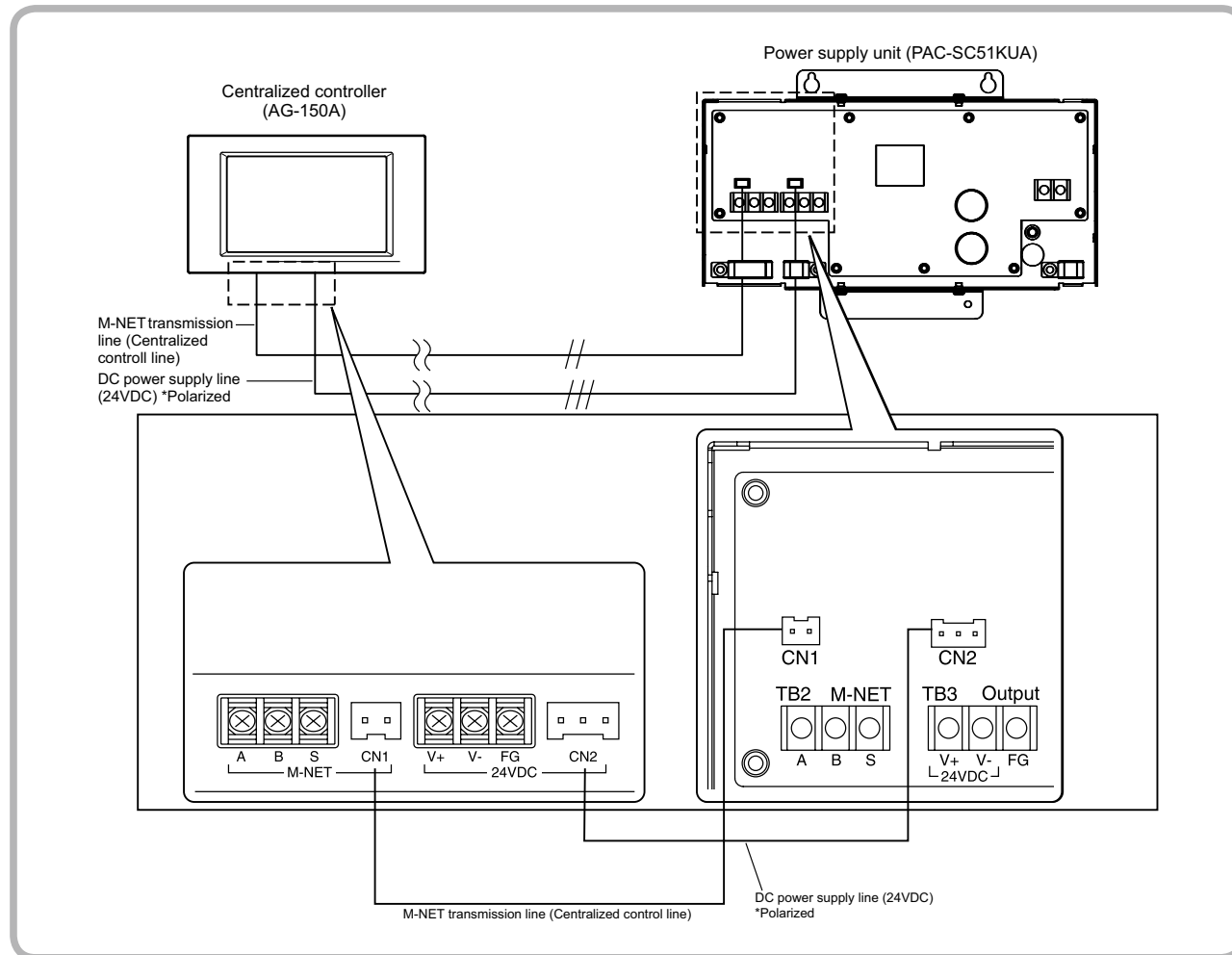
1. Connection via terminal block

The DC power cable and M-NET transmission line can be connected with a terminal block as the figure shown below.



2. Connection via connector

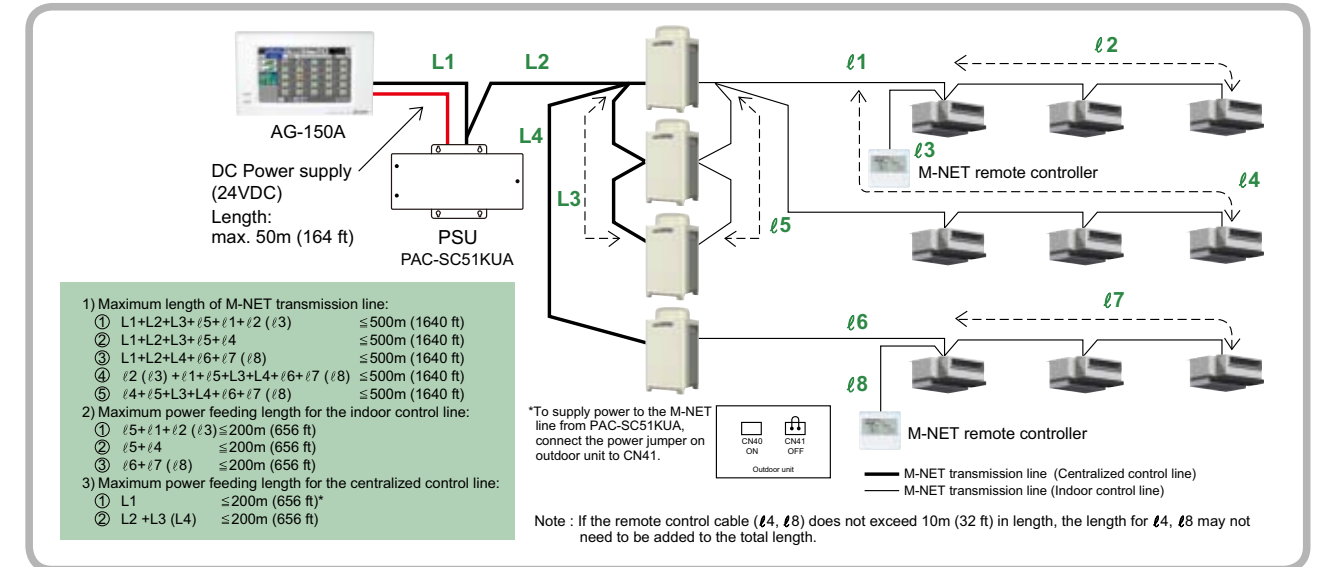
When installing AG-150A with mounting attachment A type (PAC-YG85KTB) (optional), DC power cable and M-NET transmission line is connectable via connector using a cable supplied with PAC-YG85KTB.



● Wiring Length

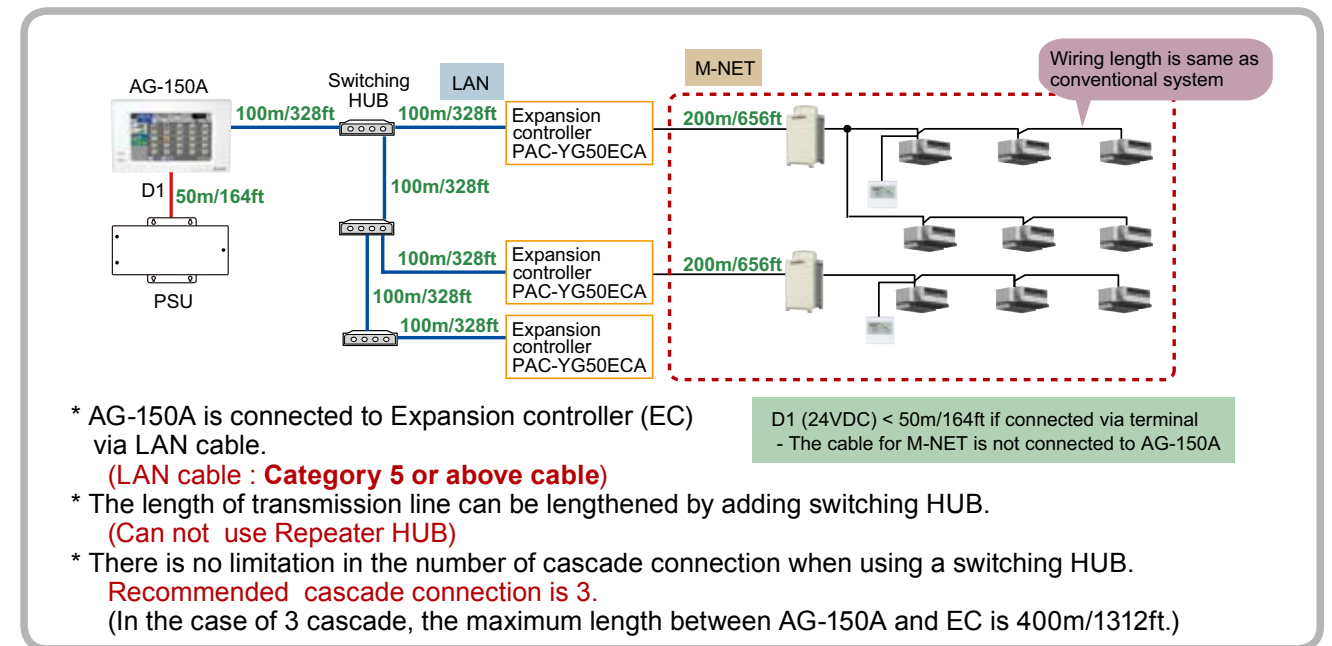
1. Management of 50 units

Allowable length of M-NET Transmission Lines and its system configuration are follows.



2. Management of 51 or more units

When managing 51 or more units, EXPANSION CONTROLLER (PAC-YG50ECA) (EC) is required. Refer to the below for wiring restrictions.



● Precautions

- ⚠ All electric work must be performed according to local regulations. Improper electrical work may result in electric shock or fire.
- ⚠ Be sure to shut off the power source of the unit and all other units to be connected to the power supply unit before wiring.
- ⚠ Do not connect AC power line to M-NET and POWER (24VDC) terminal blocks of AG-150A. Otherwise, the unit may fail.

Q & A

Q1 How many units can be controlled by AG-150A?

50 units. But use of expansion controllers (EC) allows controlling maximum 150 units. 50 units can be connected to 1 EC so max.3EC is required to control 150 units by AG-150A.

Controllable units include, indoor units, LOSSNAY, DIDO, PI and AI controller.

*DIDO has 6 contact points. 1 contact point is counted as 1 indoor unit.

*Only 5 PI controllers can be connected to 1 AG-150A.

*Depending on the model, indoor units may be counted as 2 or more units.

Q2 What happens when someone forgets the password of initial setting screen of AG-150A?

Contact your sales office. A special password will be released.

Q3 What happens when AG-150A is connected directly to the Internet?

AG-150A could be hacked. Please use a security device such as a VPN router when connecting the AG-150A to Internet to prevent unauthorized access.

Q4 Is license required for weekly schedule?

No. Weekly schedule is a standard function. License is required for seasonal (weekly1, weekly2), yearly, daily schedule, and when connected to TG-2000A.

Q5 How does optimized start-up work?

AG-150A studies the set temp, room temp (return air temp) and the data of past days (at what conditions the optimized start-up executed) and decides when to switch on the units.

Q6 What is the life span of backlight and color LCD?

Design life span is 13 years. To maintain long life, it is required to activate the automatic switch off function of backlight. We also plan to have backlight as a service parts.

Q7 What happens when LCD of AG-150A is damaged?

There is no spare part for LCD. AG-150A needs to be changed.

Q8 Is it possible to connect AG-150A to current TG-2000A?

No. You need TG-2000A Ver.5.50 and above to connect to AG-150A.

Since version of G-50A and AG-150A are different, new TG-2000A ver.5.50 and above is required.

Q9 Is it possible to send charge data by e-mail?

No. Use USB memory to extract charge parameter data.

Q10 Is it possible to connect AG-150A and G-50A in same system controlled by TG-2000A?

Yes. Use TG-2000A Ver.5.50 and above.

Q11 Can we use power supply unit PAC-SC50KUA with AG-150A?

No. Use PAC-SC51KUA.

24VDC power supply is required to drive AG-150A. Conventional G-50A used 12VDC to drive controller and this 12VDC was supplied by PAC-SC50KUA. So since PAC-SC50KUA does not supply 24VDC, it cannot be used with AG-150A.

Q12 Is it possible to put units in Refrigerant status check mode automatically?

No. You need to do it manually.

Q13 How many AG-150A can be connected to TG-2000A?

Same as conventional G-50A, 40 AG-150A can be connected to TG-2000A.
(Total of 2000 units can be connected to TG-2000A to be controlled/monitored.)

Q14 Can PC be connected to AG-150A via USB port?

No. USB port is only for USB memory.

Q15 What kind of data is extractable with USB memory?

Initial settings and charge parameter.

Q16 Can any USB memory be used to extract data from AG-150A?

No. Specified USB memory should be used.

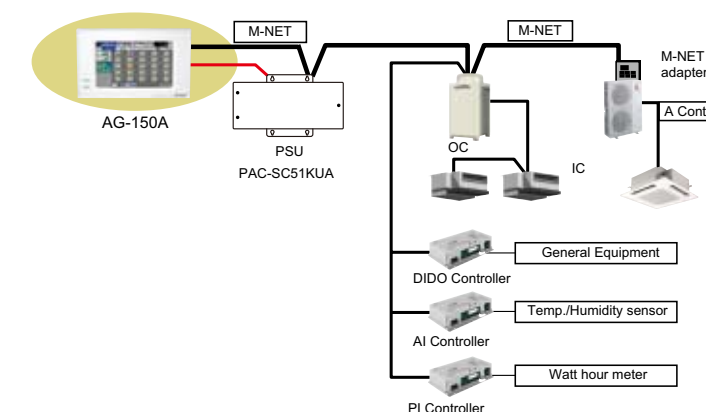
Manufacturer : SanDisk, model : SDCZ6-2048-J65RB, 2G Byte

Manufacturer : Kingston, model : DT400/2GBFE, 2G Byte

*We are planning to add brands and models of USB memory in the future.

Q17 What's the system configuration like when only 50 or less units are connected?

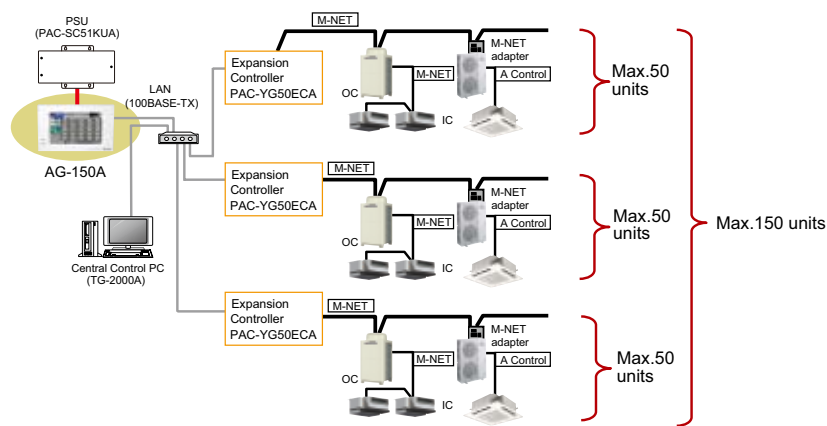
AG-150A is connected directly to M-NET (same as the conventional centralized controller G-50A.)



Q18 What's the system configuration like when more than 50 units are connected?

AG-150A connected to M-NET via Expansion Controller.

April 2009



Q19 How many AG-150A can be connected to 1 power supply unit (PAC-SC51KUA)?

One AG-150A can be connected.

Max.connectable number of controller when using PAC-SC51KUA

Centralized controller			Other system controllers	
AG-150A	G-50A	GB-50A	ON/OFF remote controller	System controller, Schedule timer, Group remote controller
1	-	1	5	10

Max. connectable number of controller when using PAC-SC51KUA

When connecting 1 AG-150A		Total number of ON/OFF remote controller					
		0	1	2	3	4	5
Total number of System remote controller, Schedule time, Group remote controller	0	✓	✓	✓	✓	✓	
	1	✓	✓	✓	✓	✓	
	2	✓	✓	✓	✓		
	3	✓	✓	✓	✓		
	4	✓	✓	✓			
	5	✓	✓	✓			
	6	✓	✓				
	7	✓	✓				
	8	✓					
	9	✓					

Q20 Is it possible to monitor and operate general equipments from AG-150A?

Yes. To connect general equipment use DIDO (PAC-YG66DCA)

Q21 Where is the serial number for AG-150A indicated?

Serial number is indicated in two places. One on the packaging box and another can be seen at the lower right corner when taking off the AG-150A cover.



Q22 What should be done if the touch panel has a poor reaction?

To adjust touch panel, go to the Initial setting, [Maintenance] and [Touch Panel Calibration] to bring up the Touch Panel Calibration screen. For further instruction, refer to the AG-150A Instruction Book.



M E M O

▶▶ AG-150A demonstration site

Access

http://www1.mitsubishielectric.co.jp/wink_doc/wink_files/acr/menu/ag150/
from your PC.



This demonstration site covers the primary functions AG-150A possesses and gives users fundamental experience of AG-150A.



FM 33568 / ISO 9001:2000

The Air Conditioning & Refrigeration Systems Works acquired ISO 9001 certification under Series 9000 of the International Standard Organization (ISO) based on a review of Quality, management for the production of refrigeration and air conditioning equipment.

ISO Authorization System

The ISO 9000 series is a plant authorization system relating to quality management as stipulated by the ISO. ISO 9001 certifies quality management based on the "design, development, production, installation and auxiliary services" for products built at an authorized plant.



Certificate Number EC97J1227

The Air Conditioning & Refrigeration Systems Works acquired environmental management system standard ISO 14001 certification.

The ISO 14000 series is a set of standards applying to environmental protection set by the International Standard Organization (ISO).

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